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INSECT REARING EXPERIMENTS
Forest Insect Laboratory
Coeur d'Alene, Idaho

May 1 to December 31, 1939

by
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Forest Insect Laboratory
Coeur d'Alene, Idaho
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The following report covers the insect-rearing operations at the Coeur d'Alene Laboratory insectary from May 1 to December 31, 1939. This includes the insects carried over the winter of 1938-39, as well as from collections made during the 1939 season. A new and improved insectary begun during the winter was completed on May 15, 1939, and all the rearing equipment and overwintering insects were moved from the old building to the new insectary on May 17, 1939.

The new building is on land belonging to the Lakes ranger district, Forest Service, a short distance beyond the east limits of the City of Coeur d'Alene. Measuring 12 x 24 feet, it comprises a screened portion 12 x 16 feet and an inclosed store room 8 x 12 feet on the west end (fig. 1). The rearing room has an 8-foot screened ceiling, and both the east and west gables are enclosed with screen, allowing a current of air to circulate below the roof and greatly aiding in keeping cool temperatures in the rearing room during the hot summer weather. Rearing material received in larva form during the summer of 1939 consisted of a Lepidoptera defoliator and a larch sawfly. Owing to a great decrease in the hemlock looper and Douglas fir tussock moth infestations, no larvae of these species were collected during the summer of 1939. The following list gives the order, host, and collection locality of all the 1938-39 overwintering material and collections made during the 1939 season.

LIST OF INSECTS REARED AT THE COEUR D'ALENE LABORATORY INSECTARY

WITH THEIR HOSTS AND HOST LOCALITY

Order and insect	Host	Locality
Coleoptera		
*Flathead wood borer	Ponderosa pine	Riggins, Ida.
Melanophila californica Van Dyke	" "	
*Spondylis upiformis Mann.	White pine	Coeur d'Alene, Ida.
Hymenoptera		
*Hyposoter pallipes (Prov.)	Douglas fir tussock moth	Hailey, Ida.
*Platycampus (Anoplonyx) laricis Roh.	Larix occidentalis	Granite, Ida.
*Platycampus (Anoplonyx) laricivorus Roh.	" "	" "
*Parisite of webworm	Hyphantria textor Harris	Hope, Ida.
**Larch Sawfly	Larix occidentalis	Thompson Falls, Mont.
**Parasite of webworm	Hyphantria textor Harris	Hope, Ida.
Lepidoptera		
*Hyphantria textor Harris	Alder	Kootenai, Ida.
Hyphantria textor Harris	Alder & chokecherry	Hope, Ida.
*Box Elder Leaf miner	Box elder	American Falls, Ida.
Diptera		
*Parasite	Platycampus (Anoplonyx) laracis	Granite, Ida.
**Parasite	Hyphantria textor	Hope, Ida.

*Overwintering 1938-39
**Overwintering 1930-40

DEFOLIATORS

Lepidoptera

The Spotless Fall Webworm
Hyphantria textor Harris

Eighteen pupae of this species of defoliator, reared from the larval stage, were overwintered at the insectary. Four adults emerged between June 2 and 8, 1939, and were identified as the spotless fall webworm, Hyphantria textor Harris. No parasites were secured from the overwintered material. The area where the larvae collection was made in 1938 was examined on July 17 and August 8, 1939. On the former date the very few recently contructed webs seen were on alder and contained larvae less than one-half inch in length. At the second examination on August 8, webs, both large and small, were in evidence along the highway bordering Pend Oreille Lake, and along the Clark Fork River for a distance of seventy or more miles. The only native tree exclusive of conifers to apparently escape attack is the birch, Betula occidentalis. Webs were seen on cottonwood, aspen, alder, chokecherry, bittercherry, elderberry, mountain ash, and willow, as well as on apple and pear trees in all the orchards bordering the infested area. Two large webs were collected, one from alder and one from chokecherry. These webs were transported intact to the insectary in a refrigeration chest and placed on fresh food plants the same day as collected. The web collected from alder contained 154 larvae and the one from chokecherry 241 larvae. The larvae comprised several instars and being voracious feeders a large amount of host plant foliage was consumed up to the time of pupation, which began September 5, 1939.

Shortly before pupation the mature webworm larvae would conceal themselves in the folds of dried-out leaves or between the stems of the host plant, then cut the long hairs from their bodies and construct a loosely woven cocoon. Soon after this cocoon was completed a dark brown chrysalid was formed by those larvae that had escaped parasitism. With a large percent of the prepupal webworm larvae that had been parasitized by a species of Hymenoptera, the parasite cocoon would be found in the loosely woven webworm cocoon along with the dried-up remains of the larvae. A few large puparia of a Dipterous parasite working on the webworm larvae were also found in the webworm cocoons in the ratio of one to each parasitized larvae.

An examination made of the caged material after all pupation was completed to determine the percent of parisitism gave the following results:

Host	No. of webs	No.of larvae	Transformation to pupae	Percent	No. parasitized by Hymenoptera	Percent	No. parasitized by Diptera sp.	Percent	No.of larvae dying during rearing exp.	Percent
Alder	1	154	62	40.0	66	42.9	9	6.0	17	11
Choke-cherry	1	241	116	48.1	63	26.1	38	15.8	24	10

If the percent of parasitism secured in the rearing experiment prevails throughout the 1939 defoliated areas, there should be a marked decrease in the webworm infestation on the infested areas in 1940.

Box Elder Leaf Miner
Gracilaria sp.

A number of box elder leaves containing pupal cases of Gracilaria species collected near American Falls, Idaho, in September, 1938, and overwintered at the insectary, were examined on May 22, 1939. No adult emergence was secured from this material, as parasitism apparently had been 100 percent. Two species of a Hymenopterous parasite emerged from the infested leaves during October, 1938.

WOOD BORERS

Coleoptera

Melanophila californica Van Dyke

During an examination of the ponderosa pine stands in the Salmon River region near Riggins, Idaho, in 1938, Mr. T. T. Terrell of the Coeur d'Alene Laboratory personnel found that a very heavy loss had occurred in some of the stands of young ponderosa pine caused by the attacks of a species of flathead wood borer. Seven three-foot sections were cut from infested trees and placed in rearing cages at the Coeur d'Alene Laboratory insectary on November 21, 1938. From forced emergence from one small stick cut in addition to the three-foot sections one adult beetle was secured on April 20, 1939. This adult along with several larvae were mailed to Washington, D. C., for a positive determination and proved to be *Melanophila californica* Van Dyke. The final results secured from the seven three-foot sections are as follows:

Cage No.	No. of sq. ft. infested bark surface	No. of adults emerging	No. adults per sq. ft. bark surface
1	9 1/2	50	5.2
2	7	11	1.5
3	7	60	8.5

Emergence began in cages numbers 1 and 3 on July 22, 1939, and in cage number 2 on July 31, 1939. The emergence period ended August 8, 1939. No parasitic or predacious insects were secured from this infested material. So far this species of Melanophila has not been collected in the vicinity of Coeur d'Alene, Idaho.

Spondylis uniformis Mann.

Three small sections of roots from D.-monticolae-infested white pine were collected on July 3, 1938, on the Coeur d'Alene National Forest. These roots were infested with cerambycid larvae believed to be Spondylis uniformis, and were placed in sterilized soil in metal containers and covered with wire screen in an attempt to rear to the adult stage. The bark on the roots was very thin and dried out rapidly, although the soil in the containers was kept moist during the remainder of the summer. The roots were left undisturbed until April 1939, at which time they were examined. The larvae had almost reached maturity but failed to overwinter. This same trouble was encountered in rearing them in small ponderosa pine stumps.

During the early part of August 1938, the writer collected Spondylis uniformis prepupal larvae, pupae and newly formed adults from the root system of white pine attacked by the mountain pine beetle during 1937. This development would indicate an emergence of Spondylis during August and possibly some adults overwintering under the bark. When the bark was very thin on portions of the roots, pupation was found to take place in small channels or pits grooved in the wood.

DEFOLIATORS

Hymenoptera

Larch Sawfly, Platycamous (Anoplonyx) laricis Roh.
" " laricivorus Roh.

Seventy-nine cocoons of the former species and 10 of the latter were carried over the winter of 1938-39. The cocoons were secured from larvae collected on an infested area near Granite, Idaho, August 8, 1938, and reared at the insectary. An emergence of 36.7 percent was secured from the P. laricis cocoons and 30 percent from P. laricivorus. Two small Diptera parasites were secured from the P. laricis material; none from the other.

The infested larch area near Granite, Idaho, where the collections were made in 1938, was examined twice during the summer of 1939. The larch showed no evidence of sawfly attack, and no larvae could be found.

Larch Sawfly
Nematus erichsonii Hartig

Stands of larch along state highway No. 3, paralleling the Clark Fork River in the Cabinet National Forest, were found attacked during 1939 by a large specie of sawfly, probably Nematus erichsonii. A collection of 125 larvae was made on July 17, 1939. In the field these larvae appeared to be gregarious in habit and could be collected in groups of 6 to 20 or more on one small twig.

When placed on freshly collected larch twigs in cages at the insectary, they left their food supply, crawled about in the cages and soon died. Only five cocoons were secured. It was believed that the rearing equipment was not suitable for this type of larvae, and a

series of large cloth-bottomed trays suspended in an open rack was constructed. The infested area was again examined on August 8, 1939, to secure additional larvae, but they had left the host trees and pupated in the duff. Five larvae in the cages pupated between July 20 and 25, 1939. Pupation of Platycampus laricis and lavicivoris in 1938 did not begin until September 14, and lasted until near the end of the month.

Fig. 1